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☐ 1. Document ID: US 20040268004 A1

L4: Entry 1 of 2 File: PGPB Dec 30, 2004

PGPUB-DOCUMENT-NUMBER: 20040268004
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040268004 A1

TITLE: Always-on removable communicator display

PUBLICATION-DATE: December 30, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Oakley, Nicholas W.	Portland	OR	US	

US-CL-CURRENT: 710/303

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20040039862 A1

L4: Entry 2 of 2 File: PGPB Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040039862
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040039862 A1

TITLE: System and method of switching between multiple viewing modes in a multi-head computer system

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hunt, Peter D.	Spring	TX	US	
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Salazar, Pablo J.	Spring	TX	US	
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US-CL-CURRENT: 710/304; 710/104, 710/303

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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L2: Entry 1 of 1 File: USPT Oct 11, 1994

DOCUMENT-IDENTIFIER: US 5355278 A
TITLE: Portable electronic apparatus having an electro-magnetic shield supporting a keyboard

Abstract Text (1):
A portable computer includes a housing and a display unit. The display unit is attached to the housing to be movable between a closed position and an opened position. The portable unit may also include a keyboard which can be covered by the display when the display is in the closed position. A circuit board is proximate to the bottom wall of the housing. A shield plate for magnetically shielding the circuit board is disposed inside the housing proximate to the circuit board and can be between the circuit board and the keyboard if a keyboard is provided. At least one supporting member extends from the bottom face of the shielding plate and abuts the circuit board to prevent the keyboard unit, if one is provided, from bending toward the circuit board. The shield plate may include an edge which is supported on the housing. The portable computer may also include bosses positioned between the bottom wall of the housing and the circuit board.

Brief Summary Text (6):
Portable computers, called laptop computers, have recently been spreading for general use. The computers of this type comprises a housing and a display unit rockably mounted thereon. The display unit is put on the housing when not in use, and is rocked to an operating position when it is to be operated.

Brief Summary Text (19):
In order to achieve the above objects, an electronic apparatus according to an aspect of the present invention is designed so that its wrong use can be mechanically prevented. More specifically, the electronic apparatus comprises a housing, input means mounted on the housing, and a display unit arranged on the housing and rotatable between a closed position in which the input means is covered by the display unit and a desired rotated position in which the input means is exposed. The display unit includes latch means which engages the housing to keep the unit in the closed position when the unit is rotated to the closed position. The latch means includes a latch hook, movable between a latch position and a release position, and an interlocking member movable in interlock with the latch hook, The display unit is provided with key means for restraining the movement of the interlocking member.

Brief Summary Text (20):
If the key means is turned on with the display unit in the closed position, according to the arrangement described above, the display unit cannot be lifted from the housing, so that the electronic apparatus itself is disabled from operating.

Drawing Description Text (4):
FIG. 1 is a perspective view of the computer with its display unit open,

Drawing Description Text (5):
FIG. 2 is a perspective view of the computer with its display unit closed,

Detailed Description Text (3):
As shown in FIGS. 1 and 2, the computer 1 comprises a base unit 3, for use as a housing, and a display unit 5. A substantially rectangular keyboard unit 7 is mounted on the upper surface of the front portion of the unit 3. An expansion box 9 is attached to the bottom portion of the rear portion of the unit 3. A handle 17 is slidably attached to the front end of the base unit 3. An operator can hold the handle 17 as he or she carries the computer 1. The handle 17 has a grip section 59 and a pair of leg sections 61 slidably mounted on the base unit 3.

Detailed Description Text (4):
The base unit 3 includes a substantially rectangular bottom case 11 and a rear top cover 13 concealing the rear portion of the case 11. A top wall of the cover 13 is stepped so that its front side is recessed, and a recess 27, opening upward and forward, is formed in the center of the stepped portion. A socket 15, which is arranged in the recess 27, is rockably mounted on the top cover 13. A cable guide duct 19 is rockably fitted in the lower part of the socket 15. The duct 19 serves to guide cables which are led out from the base unit 3 into the display unit 5. The guide duct 19 is fixed in the recess 27 of the top cover 13. The detailed structure of the guide duct 19 is disclosed in U.S. Pat. No. 4,864,523.

Detailed Description Text (5):
A leg section 37 of the display unit 5 is fitted in and screwed to the socket 15. A decorative cover 25 is attached to the upper portion of the front face of the socket 15. The cover 25 conceals tapped holes which are used to fix the socket 15 and the display unit 5. The construction of the cover 25 are described in detail in U.S. patent application Ser. No. 07/598,519 filed Oct. 17, 1990. The display unit 5 can be disengaged from the socket 15 by taking off the cover 25 and then removing screws which are used to fix the socket 15 and the unit 5. The construction of a hinge mechanism for the display unit 5 are described in detail in U.S. patent application Ser. No. 07/428,772 filed Oct. 30, 1989, now U.S. Pat. No. 5,144,290.The display unit 5 and the base unit 3 are grounded through the socket 15. The construction of a grounding mechanism for this purpose are described in detail in U.S. patent application Ser. No. 07/576,650 filed Sept. 5, 1990, now U.S. Pat. No. 5,138,565.

Detailed Description Text (7):
The display unit 5 includes a liquid crystal display (LCD) 31, a base frame 33 for fixedly holding the LCD 31, and a display cover 35 for concealing all the area of the LCD 31 except the display screen thereof. The leg section 37, which is removably fitted in the socket 15, is formed integrally with the base frame 33. The display unit 5 is rotatable integrally with the socket 15 between a rotated position in which it is inclined at a desired angle to the base unit 3, as shown in FIG. 1, and a closed position in which it conceals the keyboard unit 7, as shown in FIG. 2. A pair of latch hooks 39 are provided individually at the opposite ends of the upper portion of the base frame 33. A large number of intake slits 41 are formed at the bottom end of the display cover 35. Cooling air is introduced into the display unit 5 through the slits 41. In the display unit 5, converters (not shown) are provided individually on the opposite side faces of the LCD 31. The converters are used to boost a low voltage fetched from the base unit 3 through the socket 15 to a high voltage. A mounting structure for the converters is described in detail in U.S. patent application Ser. No. 07/577,535 filed Sept. 5, 1990.

Detailed Description Text (8):
The keyboard unit 7 includes a keyboard body 43 and a keyboard frame 45 which holds the body 43 so as to conceal the body except keys. A pair of latch holes 47 are formed at the front portion of the upper surface of the keyboard frame 45. The latch hooks 39 of the display unit 5 are adapted to engage the holes 47, individually. Hole covers 49 are rockably mounted on the inner surface of the frame 45. They are adapted to close their corresponding latch holes 47 when the hooks 39 are disengaged from the holes 47.

Detailed Description Text (9):
A dial key 55 is provided substantially in the center of the top edge of the display unit 5. It serves to restrict the movement of the latch hooks 39, thereby locking the display unit 5 in the closed position shown in FIG. 2. A large number of exhaust slits 57 are formed covering both side faces and rear face of the base frame 33 of the display unit 5. Air can be discharged from the unit 5 through the slits 57 so that the inside of the unit 5 is cooled.

Detailed Description Text (43):
As shown in FIGS. 1 and 10, a latch mechanism 40, which includes the pair of latch hooks 39, is attached to the front end portion of the display unit 5. The mechanism 40 is provided with latch holder 42 which is fixed to the inside of the front end portion of the base frame 33 of the unit 5. The hooks 39 are rockably mounted on the holder 42.

Detailed Description Text (44):
As shown in FIGS. 10 to 13, each latch hook 39 includes a hook body 159, a pair of coil springs 161, a sliding projection 163, and a projection holder 165. The hook body 159 is in the form of

a substantially rectangular plate which has a hook portion 205 at its distal end. A rectangular recess 159a is formed in the inner surface of the body 159, and the sliding projection 163, substantially rectangular in shape, is fitted in the recess 159a for vertical sliding motion. The sliding motion of the projection 163 is guided by means of a pair of guide ribs 167 which protrude from the bottom surface of recess 159a. A pair of bosses 169 also protrude from the bottom surface of the recess 159a. Each boss 169 has a tapped hole for a screw 162 used to fix the projection holder 165. The torsion coil spring 161 surrounds each boss 169. A pair of legs 171 protrude rearward from the lower end of the hook body 159, and the respective projected end portions of the legs 171 are outwardly bent in opposite directions. A pair of bosses 173 are formed individually on the opposite side faces of the lower end portion of the hook body 159. The bosses 173 serve as pivot means for the latch hook 39 which rotates relatively to the display unit 5. The bosses 173 are rotatably held by means of the latch holder 42.

Detailed Description Text (50):
FIG. 13 shows a state in which the display unit 5 is locked to its closed position by means of the latch mechanism 40. When the unit 5 is rocked to the closed position, each latch hook 39 engages its corresponding latch hole 47 on the upper surface of the front end of the keyboard unit 7. Thus, the hook body 159 and the sliding projection 163 are kept in the latch position and the restricted position, respectively, while the control plate 191 is kept in the first position. In the latch position, the hook portion 205 of the hook body 159 penetrates the latch hole 47 and engages the inner surface of the keyboard frame 45. In the restricted position, the projection body 175 of the sliding projection 163 is situated in the hole 47. The distance J between the body 175 and the rear end edge of the hole 47 is shorter than the length K of engagement between the hook portion 205 and the inner surface of the frame 45. If the latch hook 39 is slightly displaced in the direction of arrow D due to any causes, such as vibration, workmanship errors, etc., therefore, the projection body 175 abuts against the rear end edge of the latch hole 47 before the hook portion 205 is disengaged from the keyboard frame 45, so that the hook 39 is restrained from being further displaced. Thus, there is no possibility of the latch hook 39 being unexpectedly disengaged from the latch hole 47 to render the display unit 5 unlatched.

Detailed Description Text (51):
In releasing the latch mechanism 40 to unlatch the display unit 5, the operator presses one or both of the latch hooks 39 in the direction of arrow D of FIG. 13.

Detailed Description Text (54):
By the operation described above, the latch hooks 39 are disengaged from their corresponding latch holes 47, so that the display unit 5 is allowed to be swung open. If the press on the latch hook or hooks 39 is removed after the unit 5 is opened, the hook bodies 159, the sliding projections 163, and the control plate 191 are returned to the latch position, the restricted position, and the first position, respectively, by the respective urging forces of the springs 161 and 195.

Detailed Description Text (55):
When the display unit 5 is rocked from the opened position to the closed position, each latch hook 39 is automatically rocked in a manner such that the slope of its hook portion 205 is in contact with the edge of the latch hole 47, and is thus caused to engage the hole 47.

Detailed Description Text (56):
As shown in FIGS. 2 and 10, a dial key 55 is attached to the front end portion of the display unit 5. The key 55 is fixed to the latch holder 42 and situated between the two latch hooks 39. As seen from FIG. 15, the key 55 has a lock arm 68, which is movable between a locking position and an unlocking position. In the locking position, as indicated by full line in FIG. 15, the arm 68 is in the path of transfer of the control plate 191. In the unlocking position, as indicated by broken line, the arm 68 is off the transfer path. When the key 55 is on, the lock arm 68 is held in the locking position, when the key 55 is turned off, the arm 68 is moved to the unlocking position.

Detailed Description Text (58):
As the latch mechanism 40 is locked in this manner, the display unit 5 is locked to the closed position. Even if each latch body 159 is bent to unlock the mechanism 40 by force, in this state, the projection body 175 engages the rear end edge of its corresponding latch hole 47. Thus, the latch mechanism 40 cannot be forcibly unlocked.

Detailed Description Text (59):
Since the computer itself can be disabled from operating when the display unit 5 is prevented from being lifted from the base unit 3 by turning the key 55 on, wrong use of the apparatus can be securely prevented.

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L3: Entry 1 of 1 File: USPT Jul 27, 1999

DOCUMENT-IDENTIFIER: US 5929601 A
TITLE: Battery management apparatus for portable electronic devices

Abstract Text (1):
A battery management system preferably has a base station utilized in connection with a portable electronic device for providing electrical therapy to the body of a patient in response to the occurrence of a treatable condition. The portable device can have a rechargeable battery, memory, data processor for determining available operating time for the portable device prior to recharging, and a display panel, or alarm, to inform the patient of such available operating time. The portable device data processor contains an analog to digital converter which is used to obtain and record data regarding the patient, the battery, and the portable device operational status. The base station can have a receptacle to receive the portable device, including a port for transferring data between the memory of the portable device and the base station, a power supply associated with the port for supplying charging current to the battery, a computer for exchanging information with the portable device memory, and a battery maintenance portion. The maintenance portion can perform tests on the battery to evaluate the condition thereof. The base station can further include a display and alarms to inform the patient regarding the condition of both the battery and the portable device. The portable device can also include a converter-defibrillator and a second battery maintenance portion which can operate independently of the base station. Tests can be performed, during operation of the portable device, to evaluate the condition of the battery while the portable device is separated from the base station.

Detailed Description Text (2):
An apparatus is provided for monitoring and supporting the monitor-defibrillator electronics and the rechargeable battery pack provided therein. The system 10 of the present invention is shown schematically in FIG. 1. As can be seen from FIG. 1, the present system 10 involves a number of interrelated components. A monitor-defibrillator 12 is included which is operatively connectable via an interface module 26, to either a patient base station 30 or an electrode harness 66 having two groups of electrodes 14, 16. A group of delivering electrodes 14 is provided for delivering a cardioverting or defibrillating shock when necessary to a patient. Another group of electrodes 16 performs sensing operations in which the physiological condition of a patient may be monitored. The delivering electrodes 14 are operatively connected to a converter-defibrillator 19 located within the monitor-defibrillator 12. The electrode harness 66 also includes a patient display 24 with the capability of displaying visual messages, enunciating audio messages and activating audio alarms. The patient display 24 also includes various buttons for providing the patient with a means of input to the device. The operation of the electrode harness/monitor-defibrillator are more particularly described in co-pending application Ser. No. 08/651,274, assigned to the present assignee and hereby incorporated by reference herein.

Detailed Description Text (5):
The monitor-defibrillator 12 is able to perform various system and battery checks. Energy usage of the monitor-defibrillator 12 is monitored in real time to determine the useful energy remaining of the battery 18 per charge. The patient display 24 located on the electrode harness 66 indicates the operating time remaining for the battery 18. The patient may access this function at any time by pressing a button on the patient display 24. The run-time parameter is available to an external host via the communications interface located in the interface module 26. A low battery condition as determined by the monitor-defibrillator 12 is recorded in non-volatile memory of the data storage/processor 22. The patient is also alerted to a low battery condition by the patient display 24.

Detailed Description Text (8):
The patient has the capability to access buttons on the patient display 24 that when activated will cause the remaining run time to be indicated. If a patient is very active so as to cause one of the sensing electrodes 16 to have fallen off or otherwise become disconnected from the patient, an alarm is sounded. The activation of this alarm also utilizes energy which will be subtracted from the run time.

Detailed Description Text (12):
If the run time parameter indicates that the depletion of battery 18 capacity has reached the level at which the battery 18 should be recharged utilizing the patient base station 30, then the patient display 24 will provide notification. The notification will consist of visual and/or audio indicators. The notification will require acknowledgment by the patient before it will be discontinued. The notification will be repeated at predetermined intervals, for example, every 15 minutes, until the battery 18 is recharged by the patient base station 30. The monitor-defibrillator 12 can also determine the available device operating time (prior to recharging the battery), taking into account at least: (1) adjustments for abnormally high current draw of the device including adjustments for converter operation or operation of other high current draw devices as well as adjustments for excessive current draw from a defective component; (2) adjustments for normal current draw during an elapsed time period; (3) adjustments for device fault conditions such as failure of a battery load test or a problem with operation of the converter; and (4) adjustments for depletion of battery capacity during periods of non-use. The patient display 24 or alarms can be used to notify the patient of the available device operating time.

Detailed Description Text (15):
If during operation of the converter-defibrillator 19 in the slow charge mode the battery 18 voltage falls below a level at which the monitor-defibrillator 12 can reliably operate the converter-defibrillator 19, then the monitor-defibrillator 12 will deactivate the converter and evaluate the energy capability stored in the converter. If the energy stored in the converter is sufficient to deliver at least a minimal energy pulse, such as, for example, 30 joules, then the treatment cycle will continue with delivery of the available energy. If there is not enough energy stored in the converter to deliver a minimal energy pulse, then the converter will be discharged. In addition, notification will be given using the patient display 24 that the device is disabled and medical assistance should be provided to the patient.

Detailed Description Text (19):
The monitor-defibrillator interface 32 of the patient base station 30 is also operatively connected to the battery 18. In this way, the patient base station 30 can perform comprehensive tests as to the operating parameters of the battery 18. Further, charging of the battery 18 can also be performed through the monitor-defibrillator interface 32. The battery 18 of each monitor-defibrillator 12 requires periodic charging. Thus, monitor-defibrillators 12 that are not in use are to be stored on a patient base station charging port (i.e., coupled to the monitor-defibrillator interface 32), where they undergo charging and maintenance operations. The patient base station 30 provides battery status information to the patient by way of a visual display including indicator lights as well as by audio alarms provided by the patient interface 46.

Detailed Description Text (29):
The patient interface module 46, as shown in FIG. 5, can have a visual display 47, battery status LED indicators 51, acknowledge push button 57 and ambient light sensor 49. The patient interface module 46 can be operatively associated with the charger interface module 34 and the analog to digital converter 64. The analog to digital converter 64 with an analog multiplexer is preferably provided within the patient base station 30. This analog to digital converter 64 allows the single board computer 40 (FIG. 1) to monitor the charging current of the charger/discharger 34, discharging current of the charger/discharger 34, the battery voltage present at the monitor-defibrillator interface 32, the ambient light sensor 49 of the patient interface module 46 and the ambient temperature within the patient base station 30 enclosure via a temperature sensor 55 (shown in FIG. 2).

Detailed Description Text (30):
Referring again to FIG. 1, the patient interface 46 in the patient base station 30 indicates the status of the monitor-defibrillator battery 18 during the battery capacity test cycle. The patient interface 46 preferably incorporates a front panel mounted vacuum fluorescent (VF) type display 47 (shown in FIG. 4). This display 47 may be a character type with standard 5 mm,

5.times.7 dot characters. The PBS display 47 is preferably arranged in one of the following configurations: a 2 line by 40 character or a 4 line by 20 character. The PBS display 47 is controlled by the single board computer 40 via the charger interface module 34 through a parallel data interface. As an alternative, a graphics type LCD may be used for the PBS display 47. If an LCD display is used, the patient base station may include an ambient light sensor 49 to control the LCD backlight for improved readability.

Detailed Description Text (48):
Upon command from the patient base station or the monitor-defibrillator display, the monitor-defibrillator 12 performs a battery load test. The monitor-defibrillator 12 returns a pass-fail indication to the patient base station or the display. Load tests are most often performed with the display as the host. If the battery 18 fails the load test, the battery voltage measurement prior to the load test and at the point of failure are stored in the monitor-defibrillator non-volatile memory.

Detailed Description Text (57):
If the monitor-defibrillator 18 aborts the rapid charge cycle the following operations will be performed: the monitor-defibrillator 12 will configure the charger interface module 34 for float charge operation by activating I/O control lines located in the PBS/M-D interface 32; the monitor-defibrillator 12 will set it's runtime parameter to zero, which will cause patient warning messages on the display 24; and the monitor-defibrillator 12 will issue a rapid charge fault communications frame to the patient base station 30 via the PBS/M-D interface 32. If the patient base station 30 receives a rapid charge fault communications frame from the monitor-defibrillator 12, the following operations will be performed: the event will be logged in the patient base station 30 operations log file located in the data storage module 42; and the patient base station 30 will activate a patient warning message that indicates the monitor-defibrillator 12 should be serviced.

Detailed Description Text (62):
If the patient base station 30 determines that a rapid charge cycle abort is required, the following operations will be performed: an abort rapid charge cycle command will be issued to the monitor-defibrillator 12 via the PBS/M-D interface 32; the patient base station 30 will configure the charger interface module 34 for float charge operation; the patient base station 30 will issue a command to the monitor-defibrillator 12 to set the runtime parameter to zero, which will cause patient warning messages on the display 24; the event will be logged in the patient base station 30 operations log file located in the data storage module 42; and the patient base station 30 will activate a patient warning message that indicates the monitor-defibrillator 12 should be serviced.

Detailed Description Text (66):
If the monitor-defibrillator 12 aborts the discharge cycle the following operations will be performed: the monitor-defibrillator 12 will configure the charger interface module 34 for float charge operation by activating I/O control lines located in the PBS/M-D interface 32; and the monitor-defibrillator 12 will issue a discharge fault communications frame to the patient base station 30 via the PBS/M-D interface 32. If the patient base station 30 receives a discharge fault communications frame from the monitor-defibrillator 12, the event will be logged in the patient base station 30 operations log file located in the data storage module 42 and a patient warning message will be activated on the PBS display 47 that indicates the monitor-defibrillator 12 should be serviced.

Detailed Description Text (71):
If the patient base station 30 determines that a discharge cycle must be terminated, the following operations will be performed: an abort discharge cycle command will be issued to the monitor-defibrillator 12 via the PBS/M-D interface 32; the patient base station 30 will configure the charger interface module 34 for float charge operation; the patient base station 30 will issue a command to the monitor-defibrillator 12 to set the runtime parameter to zero; which will cause patient warning messages on the display 24; the event will be logged in the patient base station 30 operations log file located in the data storage module 42; and the patient base station 30 will activate a patient warning message that indicates the monitor-defibrillator 12 should be serviced.

Detailed Description Text (75):
The battery 18 energy capacity test procedure consists of the following operations: the patient base station 30 will activate a message on the patient interface 46 visual display 47 that

indicates the monitor-defibrillator 12 is being tested and to wait for the test to complete; the patient base station 30 initiates a battery discharge cycle to condition the battery for a full charge cycle; initiate a rapid charge cycle when the discharge cycle is complete to charge the battery 18 to full capacity; the patient base station 30 initiates a second discharge cycle when the rapid charge cycle is complete; and the patient base station 30 initiates a final rapid charge cycle at the completion of the second discharge cycle to ready the battery 18 for service. The duration of the second discharge cycle is timed by a counter timer located in the monitor-defibrillator 12 data storage/processor module 22. At the completion of the second discharge cycle the monitor-defibrillator 12 will compare the measured battery 18 discharge time with an acceptance parameter stored in storage/processor module 22. If the capacity discharge time is within the acceptable limit, monitor-defibrillator 12 will issue a capacity discharge pass communications frame to the patient base station 30 via the PBS/M-D interface 32.

Detailed Description Text (76):
If the capacity discharge time is not within the acceptable limit, the monitor-defibrillator 12 will set a battery capacity fault status flag located in the data storage/processor module 22, and issue a capacity discharge fault communications frame to the patient base station 30 via the PBS/M-D interface 32. The patient base station 30 will log the event in a log file located in the data storage module 42. Whenever the patient base station 30 receives a capacity discharge fault indication from the monitor-defibrillator 12, a patient warning message will be activated which indicates that the monitor-defibrillator 12 should be serviced as soon as possible. Each time a monitor-defibrillator 12 is connected to the patient base station 30, the patient base station 30 will retrieve the monitor-defibrillator 12 battery capacity fault status flag located in the data storage/processor module 22. If the battery capacity fault status flag is active, the patient base station 30 will initiate normal battery maintenance operations, with the exception of the battery capacity test which will no longer be performed. The patient base station 30 will also issue a command to the monitor-defibrillator 12 to set the runtime parameter to zero. This will cause repeated patient warning messages on the patient display 24.

Detailed Description Text (78):
When a rapid charge cycle or battery discharge cycle is initiated, the patient base station 30 will deactivate the particular one of the battery status LED indicators 51 which is the "READY" LED indicator on the patient interface module 46 and activate the particular one of the battery status LED indicators 51 which is the "CHARGING" LED indicator. During the rapid charge cycle, the patient base station 30 displays a message on the patient interface visual display 47 that the monitor-defibrillator battery 18 is being charged and the monitor-defibrillator 12 is not ready for use.

Detailed Description Text (80):
A message is displayed on the PBS display 47 indicating that the monitor-defibrillator 12 is ready for use; the PBS 30 "READY" LED 51 is activated; the "CHARGING" LED 51 is deactivated; and the monitor-defibrillator 12 is powered down.

CLAIMS:

13. The battery management system as recited in claim 2, said base station further comprising display means operatively associated with said maintenance means for displaying information indicative of the operation of the portable electronic device.

14. The battery management system as recited in claim 13, wherein said display means comprises one or more of a character display panel and LED indicators for displaying the charging condition of said rechargeable battery means.

16. The battery management system as recited in claim 2 wherein said personal electronic device further comprises:

a. data processing means for determining available device operating time before said rechargeable battery means requires recharging, said data processing means operatively associated with said data storage means;

b. said data storage means stores data corresponding to at least one of abnormally high current draw, normal current draw during an elapsed time period, device fault conditions and depletion

of battery capacity during non-use, and said data processing means utilizes said data in determining said available device operating time;

c. patient display means operatively associated with said data processing means for displaying said available device operating time; and

d. alarm means associated with at least one of said data processing means and said patient display means, said alarm means notifying a patient of said available device operating time.

17. The battery management system as recited in claim 2 wherein said personal electronic device further comprises:

a. voltage converter means for storing energy from said rechargeable battery means; and

b. control means operatively associated with said voltage converter means and said rechargeable battery means, said control means having:

i. means for determining an energy condition of said voltage converter, said energy condition including at least an insufficient energy condition wherein there is insufficient energy to both deliver a treatment to the patient and preserve operating data,

ii. means for determining a voltage condition of said rechargeable battery means, said voltage condition including at least an inadequate voltage condition wherein the battery capacity is inadequate for reliable operation of the device,

iii. means responsive to at least one of said inadequate voltage condition and said insufficient energy condition for one of operating said voltage converter means in a low current mode and terminating the operation of said voltage converter means, and

iv. discharge means responsive to said inadequate energy condition for discharging said voltage converter means; and

c. notifying means operatively associated with said control means, said notifying means informing the patient whether the personal electronic device can provide treatment based on said converter energy condition and said voltage condition, and wherein said notifying means is at least one of a means for providing an alarm, a means for providing a voice message, and a personal electronic device display means.

21. The battery management system as recited in claim 20 further comprising portable electronic device display means operatively associated with said data processing means, said portable electronic device display means for displaying said available device operating time.

28. The battery management system as recited in claim 27 wherein said means for notifying is at least one of a means for providing an alarm, a means for providing a voice message, and said personal electronic device display means.

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Search History

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	DB=PGPB,USPT,USOC; PLUR=YES; OP=OR		
L1	710/300-304,105;709/225,230.253;713/300,320,324;361/683-686,725-730;340/286.02,531;379/93.37,93.17;455/566,351,575.1.ccls.	18188	L1

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L4	l1 and L3	2	L4
L3	L2 and ((primary or main) adj1 display)	39	L3
L2	(portable adj1 (device or unit)) same display same (computer or dock$3)	1409	L2
L1	710/300-304,105;709/225,230.253;713/300,320,324;361/683-686,725-730;340/286.02,531;379/93.37,93.17;455/566,351,575.1.ccls.	18188	L1

END OF SEARCH HISTORY